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U.S. Application No. 09/972,797

LISTING OF THE CLAIMS

1. - 70. (canceled)

71. (canceled)

72. (currently amended) A method of retrieving a data item from a memory unit in a data processing apparatus comprising a SIMD (single instruction multiple data) array of processing elements, wherein the processing elements are operably divided into a plurality of processing blocks, the processing blocks being operable to process respective groups of data items and which wherein the data processing apparatus includes a said memory unit in which data items are stored at addresses therein, and to which the a plurality of processing elements which have access to the memory unit, the method comprising:

for each processing element in the array which requires access to the memory unit, setting an access indicator to indicate that the processing element concerned requires access to the memory unit, and storing a target address of the memory unit to which such access is required;

selecting one of the processing elements having the access indicator set, and retrieving the stored target address from that selected processing element;

transmitting the retrieved target address and transaction identification information to the processing elements in the array;

for each processing element having the access indicator set, comparing the transmitted target address with the stored target address, and if the stored and transmitted target addresses are equivalent, clearing the access indicator and storing the transaction identification information;

retrieving at least one data item stored at the transmitted target address in the memory unit;

transmitting the or each retrieved data item and associated transaction identification information to the processing elements in the array; and

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for each processing element having stored transaction identification information, comparing the stored transaction identification information with the transmitted transaction identification information, and if the stored transaction information is equivalent to the transmitted transaction information, receiving the or each retrieved data item.

73. (currently amended) A method of writing data items to a memory unit in a data processing apparatus comprising a SIMD (single instruction multiple data) array of processing elements, wherein the processing elements are operably divided into a plurality of processing blocks, the processing blocks being operable to process respective groups of data items, ~~including~~ and wherein the data processing apparatus includes the a memory unit in which data items are stored at addresses therein, and to which the plurality of processing elements ~~having~~ have access to the ~~memory unit~~, the method comprising:

for each processing element in the array which requires access to the memory unit, setting an access indicator to indicate that the processing element concerned requires access to the memory unit, and storing a target address of the memory unit to which such access is required;

selecting one of the processing elements having the access indicator set, and retrieving the stored target address from that selected processing element;

transmitting the retrieved target address and transaction identification information to all the processing elements in the array;

for each processing element having the access indicator set, comparing the transmitted target address with the stored target address, and if the stored and transmitted target addresses are equivalent, clearing the access indicator and storing the transaction identification information;

transmitting transaction identification information to the processing elements in the array;

for each processing element having stored transaction identification information, comparing the stored transaction identification information with the transmitted transaction identification information, and if the stored transaction information is equivalent to the transmitted transaction information, transmitting at least one data item to be stored in the memory unit at the target address; and

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storing the or each transmitted data item at the target address in the memory unit.

74. (original) A method as claimed in claim 73, wherein processing elements store data items at respective regions of the target memory address.

75. - 88. (canceled)

89. (canceled)

90. - 198. (canceled)

199. (canceled)

200. (currently amended) ~~A method of retrieving a data item from a memory unit in~~
In a data processing apparatus which includes, a method of retrieving a data item
from a memory unit in which data items are stored at addresses therein, and said
data processing apparatus further comprising an array of a plurality of processing
elements which have access to the memory unit, the method comprising:

for each processing element in the array which requires access to the memory
unit, setting an access indicator to indicate that the processing element concerned
requires access to the memory unit, and storing a target address of the memory unit
to which such access is required;

selecting one of the processing elements having the access indicator set, and
retrieving the stored target address from that selected processing element;

transmitting the retrieved target address and transaction identification
information to the processing elements in the array;

for each processing element having the access indicator set, comparing the
transmitted target address with the stored target address, and if the stored and
transmitted target addresses are equivalent, clearing the access indicator and
storing the transaction identification information;

retrieving at least one data item stored at the transmitted target address in the
memory unit;

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transmitting the or each retrieved data item and associated transaction identification information to the processing elements in the array; and
for each processing element having stored transaction identification information, comparing the stored transaction identification information with the transmitted transaction identification information, and if the stored transaction information is equivalent to the transmitted transaction information, receiving the or each retrieved data item.

201. (previously presented) A method as claimed in claim 200, wherein retrieved data is returned in the order in which the transaction identification information is produced.

202. (previously presented) A method as claimed in claim 200, wherein the retrieved data is returned in the order in which it is retrieved from the memory.

203. (previously presented) A method of writing data items to a memory unit in a data processing apparatus including the memory unit in which data items are stored at addresses therein, and an array of a plurality of processing elements which have access to the memory unit, the method comprising:

for each processing element in the array which requires access to the memory unit, setting an access indicator to indicate that the processing element concerned requires access to the memory unit, and storing a target address of the memory unit to which such access is required;

selecting one of the processing elements having the access indicator set, and retrieving the stored target address from that selected processing element;

transmitting the retrieved target address and transaction identification information to all the processing elements in the array;

for each processing element having the access indicator set, comparing the transmitted target address with the stored target address, and if the stored and transmitted target addresses are equivalent, clearing the access indicator and storing the transaction identification information;

transmitting transaction identification information to the processing elements in the array;

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for each processing element having stored transaction identification information, comparing the stored transaction identification information with the transmitted transaction identification information, and if the stored transaction information is equivalent to the transmitted transaction information, transmitting at least one data item to be stored in the memory unit at the target address; and storing the or each transmitted data item at the target address in the memory unit.

204. (original) A method as claimed in claim 203, wherein processing elements store data items at respective regions of the target memory address.

205. (previously presented) A data processing apparatus comprising a SIMD (single instruction multiple data) array of processing elements, data storage means for storing data items for access by the processing elements, and control means for controlling access to the storage means in accordance with a method as claimed in claim 204.